Response from Brett McCarty to January 26th Draft and rulemaking meeting in Boise.

Suggested criteria for continued rulemaking language and concepts with limited time for completion:

1. Does this concept or rule language protect the resource? How?
2. What is the rationale behind this concept, i.e. provide evidence in support of the concept, i.e. well logs?
3. Can this concept be regulated and enforced, how?
4. Therefore: should this concept be explored to become a rule, and is there time to explore this concept further?

Note: I personally feel that IDWR is pushing too hard and must consider backing off the hard line on rushed rulemaking and compressed timing. Too much time has been lost early on with focus upon inconsequential issues. We must relax a little, and give this activity more time because there is too much at stake. Rushed rulemaking can only result in a codification of concepts that are difficult and costly to enforce, and difficult for the regulated to comply with.

04 Annular Space.

Line 87 and 88 strike entire last sentence. Contractors will become unable to leave a customer with a six inch well and later determine that gravel packing is necessary without first needing to ream the borehole open to 7 inches to meet minimum annular space outside of SDR17 PVC bells. Extreme expense for too little benefit. More focus needed on seal installation methodology.

06 Area of Drilling Concern. Suggest adding language to further describe this designation for areas that have been contaminated. I know it's off limits for negotiating, and this is only a clarification of it's intents and purpose.

Would like to see a new 07 Area of Geologic Condition add language presented on written sheet. To be modified. Should include language to describe the use of the Drillers Advisory Committee to approve any such designations presented by IDWR for consideration. Suggested text:

Area of Geologic Condition. The geologic conditions that exist throughout the state are diverse and difficult to encompass within the scope of standardized construction rules. (first sentence optional) In any area, where the geologic conditions may compromise the Departments ability to provide resource protection through current well construction rule, a designation called an "Area of Geologic Condition" shall be applied to such as area by the Director.

A description of the geologic conditions that exist, along with suggested alternative methods of construction, necessary to ensure ground water resource protection shall be applied. The "Drillers Advisory Committee" shall approve all such designations, and assist in their development.

07 line 98 Artesian Well. If encountered in bedrock wells, the casing should be driven into the bedrock, if encountered in alluvium, the casing should be terminated within the confining layer above the producing zones. Consider terms such as fine grained layer or layer of lowest permeability.

17 or line149 Competent Unit. Change to Stable Unit or Stable Formations.
Line 151 strike non-fractured and non-weathered. Many many formations can and are drilled through that meet this description, but can be opened and will stand open without any caving whatsoever. PVC liner is installed, removed, and re-installed in these formations, and have been for years. The basis for requiring gravel packing should be specific to formations that have demonstrated an inability to allow the PVC to remain round and free from caving and to allow its removal and re-installation.

32 or line 203 suggest changing to Unstable Unit or Unstable Formation. Strike decomposed or weathered bedrock, easily fractured or friable bedrock. Many preCambrian sedimentary formations such as highly metamorphosed medisedements have lenses of mica schist and gneiss that are decomposed, weathered, fractured and friable, but will stand open without any artificial propping or sand packing for years. What is needed is a description of rock that caves and crushes PVC to such degree that the removal and re-installation of the PVC, and the installation and removal of submersible pumps are not possible without gravel packing to further ensure stability.

Another purpose for sand or gravel packing is to slow down the entrance velocities of fractured bedrock formations that have not been fully metamorphosed to prevent silting. In northern Idaho we have the Wallace fm. That has a middle, upper and lower segment. The upper segment is very soft, frequently produces silt within fractured layers and produces poor quantities of ground water. Gravel packing is likely to help maintain the borehole integrity, reduces entrance velocities and allows for the development of clean groundwater to flow into the pumping chamber within the PVC liner or casing. Idaho City is another area that gravel packing helps with poor water quality (silting), however, gravel packing, as discussed within this committee is not typically associated with resource protection.

34 or line 224 suggest striking b) and leave the section to read:

A conduit of pipe that serves as an access and protective housing for pumping equipment and provides for the downward movement outside the PVC and upward movement of groundwater within the PVC. PVC liner can be removed and re-installed when necessary without collapse to the borehole. PVC liner is not intended for the purpose of stabilizing or preventing collapse of a borehole.

Rationale: The ability to later determine (either post construction or during) that a segment of a borehole that produces rusty, silty, or highly mineralized groundwater is undesirable, and to retain the ability to exclude that groundwater contribution to the better quality groundwater below, and seal it off via a shale trap and or shale trap and bentonite is highly useful. The proposed language (Jan 26 draft) precludes that option.

Line 348 Table for separation: Potentially Hazardous Underground Tanks. We have discussed this repeatedly and I have gotten nowhere with IDWR. Drillers are not aware of what lies beneath a customers land prior to construction or post construction of a water well, and should not be forced to accept such responsibility. IDWR's rationale has been to place the responsibility upon the driller and let the driller transfer contractual obligations upon their customers. Legally, if this concept is codified, IDWR will be obligated to enforce wherever necessary and the driller will be in jeopardy for unknown underground tanks that may or may not cause contamination. This is way out of reason. The limit of responsibility for the driller should be limited to a requirement of formally notifying the landowner of the rules and offset distances from the well site, have the customer sign the IDWR permit and allow the landowner to accept this unquantifiable and unknown responsibility. By simply changing the Start Card and adding to the line that currently states offset requirement to septic tanks and include this potentially hazardous tank language there, if it can be demonstrated by IDWR to be absolutely necessary. There is no legal precedence whereby legal responsibilities can be transferred from any regulated licensee to his or her customer.

Also, language is needed to make waivers an option if small lots on waterfront property for example is not large enough to accommodate septic drainfield equipment and a well without placing the well closer to the water than allowed in this table. Perhaps simply include a sentence that states: In cases where minimum separation distances are not capable, a waiver may be submitted. (See Section 02. Waiver) Do not make properties unbuildable because IDWR can make a rule that says a well may be too close to a canal or river without considering all of the circumstances.

Line 455, ii Incompetant Units. Change to unstable please! Strike "or alternating". The well either caves or it does not. The use of alternating will be a nightmare for IDWR to regulate and will succumb to second guessing on well driller reports and inaccurate lithologies. Does the well bore cave? Then Gravel Pack It! Also, line 462 needs to include the use of a shale trap as a centralizing tool and bentonite as a sealing material in conjunction with its use.

Consider changing this passage to read:
Unstable Formations. Thermoplastic pipe may be used in the construction of wells in formations that consistently demonstrate instability or caving after repeated attempts to re-drill or clean out debri. If steel casing is not an option, such boreholes may be cased with thermoplactic PVC casing with a minimum rating of SDR 17, shall be centralized a minimum of every 40 feet, and shall be gravel packed from the bottom of the borehole to the top of the highest segment of the borehole that demonstrated caving characteristics or up into the steel casing. A shale trap may be used as a centralizer and sealing barrier in appropriate applications.

Line 503 Plumbness and Alignment: This passage does not consider line shaft turbine pumps and submersible pumps separately. It should be made necessary to perform

alignment tests on all wells that are constructed for the intended use of a line shaft turbine, and only optional, at the discretion of the Director, if a submersible is intended for the well. Every case I have seen where the well is too crooked for a line shaft turbine, a submersible is installed in its place and it works just fine.

Line 567 Requirements for Sealing
In many cases, I have constructed wells wherein casing was driven through sand, gravel, and boulders. No water being found on top of the bedrock, the casing was seated into the rock, and water was found within the first few feet where weathering has occurred, and fractured or decomposed rock stores groundwater. By requiring sealing of 5 (or 10) feet into the bedrock, in an effort to exclude possible future pollution and contamination, precludes development of those "top of bedrock" resources, and forces the well owner to explore deeper into bedrock. How does IDWR support sealing in this situation, which is quite common?

In areas where ground water exists above a bedrock formation, in conjunction with the situation of having undesirable quantities or qualities necessitates the need to case off that water and drill deeper into the bedrock, it is then reasonable to install a formation seal in the fashion that is described in the Jan 26 draft, 5 feet being sufficient due to the fact that drilling deeper into the bedrock isn't necessary. Also, the use of a shale trap and bentonite should be acceptable if it can be demonstrated that it does indeed seal.

Wouldn't it be prudent to say that in areas that have been identified as those having potential for agricultural or industrial contamination, through the use of an "Area of Drilling Concern", or "Area of Geologic Condition" designation, utilizing or incorporating rules that can be written to require the sealing out of ground water to protect from possible spreading of contaminants? Most areas throughout Idaho are rural and not like that of the Boise Valley, and are not likely to be subjected to nitrate or petroleum contamination due to the fact that most wells are supplying domestic drinking water to five or ten acre parcels in hilly terrain, no factories, no farms, just woods.

Line 601 what was decided during the meeting concerning the terms "non-degrading" and "promote growth of microorganisms"? All bentonites are degradable and concrete surely degrades over time due to shrinkage. Is this necessary?

Line 603 This passage needs to describe the sand size and ratio 10/12 or 20/40 add another line describing dry bentonite

Line 612 This needs to say "on a case by case basis" and attention needs to be paced on the heat caused from hydration of cement.

Line 628 b. strike "cement grout, or neat cement" and replace with "or approved grout"

Line 631 strike "Only" and replace with "If" and strike "shall be" and replace with "are to".

Line 635 no hydrate granules, or hydrate chips. It has been determined that dry bentonite Seals are better due to their high solids content and the flow-ability of fine grained bentonite, strike hydration concept, tagging is all that is needed.

Line 644 This table needs more work. I have no suggestions at this time, but will work on this.

Line 896 drive points driven to 18 feet should be required to have some kind of seal. We have guys up the Coeur d'Alene river country who use a plate welded beneath a backhoe bucket, and they drive 2" pipe into the ground and make wells with no seals. When the process fails to deliver water, the pipe is then pulled out and re-used at another location, again, no bentonite.

Line907 temporary casing. I have been very successful in placing well seals in unconsolidated formations via the use of an 8" temporary steel casing for many years. It has been determined of late, through the Nebraska Well Sealing Study, that larger diameter seals do indeed fail sooner than thinner, well placed seals. During rulemaking discussions we have all agreed that dry bentonite surface seals using #8 bentonite with high solids makes a superior dry surface seal. Consider reducing the 10" requirement back to 8" and place more focus on the process of installation of bentonite and removal of temporary casing. Suggest integrating 03 and 04 to read as follows:

> Temporary Casing. If a temporary casing is utilized as a means of maintaining an open borehole for the purpose of installing sealing material, a minimum of (2) inches larger than the permanent casing (for example a 6" permanent casing would require an 8" temporary casing) shall be required.
>
> Removal of the temporary casing shall be accomplished by filling the annular space with dry #8 bentonite inside a dry annular space, then removing the t emporary casing by extraction and any method preferable to vibrate or encourage settling of bentonite while extracting. A tagline shall be used to ensure proper settling while extracting casing.
>
> In the case where wet annular spaces and casings exist, or in cases where water is standing above the bottom of the intended seal bore, the proper sealing method shall be a pumped grout material, and grout shall be tremied into the annulus prior to extracting the temporary casing such that grout shall be brought to the surface after extraction of temporary casing.

Note: During the IGWA Convention (Feb 1 & 2), there were two speakers (Mr. Mike Krautkramer and Mr. Dave Hanson) who presented at the convention and have considerable insights with well sealing and well disinfection. Did any IDWR staff attend these workshops? Were they consulted concerning these rulemaking topics? New

findings were discussed concerning the Nebraska Well Sealing Study and are applicable to this rulemaking effort.